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Book Review: *Nitrate and Man: Toxic, Harmless or Beneficial?* by J. L'hirondel and J.-L. L'hirondel

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BOOK REVIEWS

Nitrate and Man: Toxic, Harmless or Beneficial?

J. L'hirondel and J.-L. L'hirondel, CAB International, Wallingford, Oxfordshire, OX10 8DE, UK. Translated from the French version Les nitrates et l'homme: Le mythe de leur toxicité *(Editions de I'Institut de l'Environnement, 1996). 2001. 168 p. $65.00 hardcover. ISBN 0851995667.*

The concluding paragraph of the book notes that "The history of nitrate is that of a world-scale scientific error that has lasted for more than 50 years. The time has now come to rectify this regrettable and costly misunderstanding." The senior author of this book was a pediatrician who devoted a portion of his life to the study of methaemoglobinaemia in infants and the relationship to nitrate concentrations in water supplies. This book is not a biased casual overview of the nitrate problems and the levels in drinking water but an extremely thorough and thought-provoking analysis of our current understanding of the role of nitrate and nitrite in our drinking water and diet. There are more than 620 references cited in this book from all of the studies conducted around the world on nitrates and human health. The authors are to be commended for their thoroughness in this analysis. The contents of this book are divided into eight chapters: "The History of Nitrates in Medicine," "Nitrate, the Nitrogen Cycle and the Fertility of Nature," "The Metabolism of Nitrate," "Nitrate in Body Fluids," "The Case Against Nitrate: A Critical Examination," "Nitrate Regulations: Presentation and Discussion," "The Beneficial Effects of Nitrate," and "Summary and Conclusions."

Nitrates and their role in human health have been the subject of study since the 12th century and various forms of nitrate have been considered important for our well-being. We tend to look at nitrate and nitrite as negatives in terms of our well-being. The current concern about nitrate and methaemoglobinaemia can be traced to an article written in 1945 by Comly (J. Am. Med. Assoc. 129:112–116) and the carcinogenic effects from nitrosamines to an article in 1956 by Magee and Barnes (Br. J. Cancer 10:114–122). However, how many of us have taken the time to evaluate critically the original paper that is used to provide the supporting evidence for policy that is being used to drive a lot of the current research on nitrogen management? The authors have conducted an analysis of the evidence for the 10 mg L^{-1} on methaemoglobinaemia and conclude that there is confounding data on the nitrate levels because many of the studies that show a health effect of high nitrate levels may have been more related to bacterial contamination that created the biological reaction. There has also been a lack of methaemoglobinaemia cases in the past 50 years caused more by the increase in water quality due to reduced biological contamination rather than a reduction in nitrate levels. The authors do not have any stake in the nitrate debate and offer the evidence as a pursuit of a more complete understanding of the confusion over nitrate levels and their effect on the human body. The appendix in this book contains a summary of the role of nitrate in the human body and the results from all of the different studies, and is a resource that is valuable and educational in itself.

The current debate on nitrate levels in drinking water in the United States and throughout the world is causing a lot of potential energy to be expended on reducing nitrate levels to less than 10 mg L^{-1}. I don't believe we should take these conclusions from the book to cease our efforts to reduce nitrate leaching and the potential improvement on water quality but to place our efforts to focus on helping agriculture use nitrogen more efficiently. I recommend this book as a reading material for all researchers involved in studying nitrate and nitrite levels not because of the introduction into the medical debate but the approach these authors have taken to survey and evaluate the current literature to arrive at conclusions that raise questions. This book helps place the information into a context about nitrate levels in our water and food and the meaning of these concentrations on our health. This book would be a good resource for environmental science classes to create another source of information on water quality. This book is a must-read for all environmental scientists to create an inquisitiveness about the sources and interpretation of the data being used to create policy.

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